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ERGONOMIC POINTING DEVICE

FIELD OF THE INVENTION

The present invention relates generally to an ergonomic pointing device. More specifically, the present invention relates to an ergonomic pointing device that is mounted to a finger of a users hand and allows the user to initiate an action in a device by urging a pointing implement carried by the ergonomic pointing device into contact with the device.

BACKGROUND OF THE INVENTION

There are many portable devices such as personal digital assistants (PDA's), tablet personal computers (TPC's), cell phones, global positioning receivers (GPS), and devices equipped with touch-sensitive displays that are responsive to a pointing implement (e.g. a stylus) that is manipulated by a hand of a user of the device. Although the pointing implement serves the ergonomic needs of the user for some foreseeable uses of the device, there are some uses for which the pointing implement is not ergonomically efficient.

For example, when a PDA is held in the hand of a user in an environment such as an office, a home, a passenger seat of a car, or an airplane seat, the user can rest his/her arm on a desk, a table, or an arm of a chair or a seat. In those environments, a stylus carried by the PDA can easily be used to initiate actions in the PDA by touching the stylus to a touch-sensitive display of the PDA to drag icons, open and close files, to start or close programs, etc.

On the other hand, when the user is in an environment where his/her body is in motion, is subject to vibration, or the user cannot hold the PDA, then touching the stylus to the touch-sensitive display of the PDA can cause entry errors, especially if the users hand cannot be held steady while trying to initiate an action in the PDA. Moreover,

there are other difficulties that impair efficient data entry and command initiation in the PDA. First, the users hand may obscure visibility of a portion of the touch-sensitive display that the user is attempting to touch the stylus to. Second, a speed at which information can be entered using the stylus is impaired by the large motor muscles involved in moving the hand and arm and the overall mass of the arm and hand. Third, as mentioned above, in an environment with a lot of motion (e.g. in a moving vehicle) precision of input is affected as it is difficult to maintain stability between the input hand and the PDA. Fourth, because the stylus is typically removed from a slot or the like in the PDA, the stylus tends to get lost or misplaced by the user. Fifth, because the stylus must be held by the hand of the user, the use of the stylus tends to get in the way of other natural operations while doing information input on the PDA.

As another example, some PDA users load application specific programs on their PDA, such as navigation software. If the PDA is used by a glider pilot to navigate the glider, then the use of a hand held stylus is problematic due to air currents that cause the glider to vibrate and the lack of an extended surface to stabilize the hand and the PDA at the same time. As a result, the glider pilot cannot steady his/her hand to input information or initiate commands using the stylus.

Consequently, there is a need for an ergonomic pointing device that allows a user to input information or initiate commands on a device in a moving environment. There is also a need for an ergonomic pointing device that allows a user to input information or initiate commands on a device without the pointing implement itself or the users hand obscuring visibility of the device. There is also a need for an ergonomic pointing device that allows a user to input information or initiate commands on a device without using the whole hand, that allows the user to establish a reliable position between the device and the hand doing the input, and allows for an increase in a speed at which information can be input on the device. Finally, there is a need for an ergonomic pointing device that is not easily lost or misplaced and can be stowed away so that it does not get in the way of the user when the pointing device is not needed.

SUMMARY OF THE INVENTION

In view of the foregoing, a brief summary of some of the exemplary embodiments of the present invention are presented in this summary. Some simplifications and omissions may be made in this summary, which is intended to highlight and introduce some aspects of the present invention, but not to limit the scope of the present invention in any way. Detailed descriptions of the preferred embodiments adequate to enable one of ordinary skill in the art to understand, make, and use the present invention are provided following this summary.

Broadly, the present invention is embodied in an ergonomic pointing device that is manipulated by a finger of a user to initiate an action in a device. The action initiated can be any action including but not limited to entering or retrieving information, opening or closing a program or algorithm, selecting an item from a menu of items, dragging and dropping an icon on a display, just to name a few. The ergonomic pointing device includes a holder that is adapted to be mounted on at least a portion of a finger of the users hand and a pointing implement mounted on the holder. With the pointing implement mounted on the holder, the user manipulates the finger to urge the pointing implement into contact with the device to initiate an action in the device. The contact between the pointing implement can include the actuation of a button or switch on the device or touching a desired portion of a touch-sensitive display or a touch-sensitive cursor pad on the device, for example.

The aforementioned need for entering information or initiating an action in a device is met by the ergonomic pointing device of the present invention because the ergonomic pointing device is mounted on a users finger thereby freeing up the users hand for other tasks and allowing the user to steady his/her hand while manipulating the finger to position the ergonomic pointing device to make contact with the device. The same hand having the finger upon which the ergonomic pointing device is mounted can be used to hold the device while the pointing implement initiates actions thereby freeing up the users other hand to perform other tasks. Because the ergonomic pointing device is mounted on the users finger, visibility of the device is not impaired while the

users manipulates the finger. The ergonomic pointing device can be movably mounted to the holder or may be removable from the holder such that the ergonomic pointing device can be stowed away when not needed and/or to prevent the ergonomic pointing device from getting in the way of the user. Furthermore, the ergonomic pointing device allows the user to establish a reliable position between the device and the hand manipulating the finger and allows for increased information entry on the device. The ergonomic pointing device of the present invention is well suited to the ergonomic needs of users who must interact with the device in a moving environment, such as an automobile or an aircraft, for example.

Other aspects and advantages of the present invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side profile view depicting an ergonomic pointing device with a pointing implement in an engaged position according to the present invention.

FIG. 2 is a side profile view depicting an ergonomic pointing device with a pointing implement in a non-engaged position according to the present invention.

FIG. 3a through **3d** are profile views depicting examples of a pointing implement according to the present invention.

FIG. 4 is a side profile view depicting a holster connected with a holder according to the present invention.

FIG. 5a is a cross-sectional view along line **A-A** of **FIG. 4** and depicts a holster that is removably connected with a holder according to the present invention.

FIG. 5b is a cross-sectional view along line **A-A** of **FIG. 4** and depicts a holster connected with a holder according to the present invention.

FIG. 6a is a side profile view depicting a holster that is removably connected with a holder according to the present invention.

FIG. 6b is a side profile view depicting a holster connected with a holder according to the present invention.

FIGS. 7a and **7b** are top and bottom profile views respectively of a holder and a fastener connected with the holder according to the present invention.

FIG. 7c is a side profile view of the holder of **FIGS. 7a** and **7b** and depicts the holder fastened together according to the present invention.

FIG. 8a is a top plan view of a holder with a plurality of slits formed therein for mounting a pointing implement on the holder according to the present invention.

FIG. 8b is a side profile view of a pointing implement mounted on the holder using the slits of **FIG. 8a** according to the present invention.

FIG. 9 is a side profile view depicting various portions of a finger of a users hand.

FIG. 10 is a side profile view depicting an ergonomic pointing device mounted on one of the portions of the finger depicted in **FIG. 9**.

FIG. 11 is a profile view of a pointing implement including a pin and an o-ring thereon according to the present invention.

FIG. 12 is a side profile view of a holster with a groove therein adapted to receive the pin depicted in **FIG. 11** and to position the pointing implement in an engaged position according to the present invention.

FIG. 13 is a side profile view of a holster with a groove therein adapted to receive the pin depicted in **FIG. 11** and to position the pointing implement in a non-engaged position according to the present invention.

FIGS. 14a and **14b** are profile views of alternative embodiments of a holder and a holster according to the present invention.

FIG. 15a is a cross-sectional view of a holster including a resistance element according to the present invention.

FIGS. 15b and **15c** are cross-sectional views of a pointing implement inserted in the holster of **FIG. 15a**.

FIG. 16 is a side profile view of an alternative embodiment of an ergonomic pointing device according to the present invention.

FIG. 17 is a side profile view of an alternative embodiment of an ergonomic pointing device according to the present invention.

FIG. 18 is a side profile view of an alternative embodiment of an ergonomic pointing device according to the present invention.

FIGS. 19a and **19b** are a profile view and a cross-sectional view respectively of a pointing implement including an aperture therein according to the present invention.

FIGS. 20a and **20b** depict a holster including pins and the pointing implement of **FIG. 19b** mounted in the holster according to the present invention.

DETAILED DESCRIPTION

In the following detailed description and in the several figures of the drawings, like elements are identified with like reference numerals.

As shown in the drawings for purpose of illustration, the present invention is embodied in an ergonomic pointing device. The ergonomic pointing device is manipulated by a finger of a user to initiate an action in a device. The ergonomic pointing device includes a holder that is adapted to be mounted on at least a portion of the users finger and a pointing implement mounted on the holder. The pointing implement can be mounted on the holder using a wide variety of means as will be discussed below. With the pointing implement mounted on the holder, the user manipulates the finger that the holder is mounted on to urge the pointing implement into contact with the device to initiate the action in the device.

In **FIG. 1**, an ergonomic pointing device **10** includes a holder **11** mounted on a portion of a finger **5**, a holster **13** connected with the holder **11**, and a pointing implement **15**. The holster **13** is adapted to receive the pointing implement **15** so that the pointing implement **15** is mounted on the holder **11**. The ergonomic pointing device **10** can be mounted on any finger **5** on a users hand. For example, the ergonomic pointing device **10** can be mounted on an index finger of the users hand. After mounting the pointing implement **15** on the holder **11**, the user (not shown) manipulates the finger **5** to urge the pointing implement **15** into contact with a device **50** to initiate an action in the device **50**. The pointing implement **15** can include an end portion **14** that tapers to a point (e.g. to a tip or the like). For example, if the pointing implement **15** is a writing implement, such as a pen or a pencil, then the end portion **14** can be the lead of the pencil or the tip of the pen. The pointing implement **15** need not terminate at a tip and can include an end **15e** that is blunt, flat, or rounded (see **15e** in **FIG. 18**). In **FIG. 1**, the end portion **14** of the pointing implement **15** is urged into contact with the device **50** to initiate the action. An advantage to the end point **14** is that it allows for a more accurate contact with the device **50** due to a smaller contact area of the end point **14**.

The action initiated by the contact of the pointing implement **15** with the device **50** can be any action that can be initiated by a contact. Examples of the actions that can be initiated include but are not limited to: entering or retrieving information; opening or closing a program or algorithm; selecting an item from a menu; dragging and dropping an object on a display; moving a cursor on a display; selecting ASCII characters from an image of a QWERTY keyboard displayed on a touch-sensitive display; scrolling a display; highlighting text or other objects on a display; selecting an object on a display; cut and paste operations; actuating a button or a switch resulting in some action being initiated; actuating a joy stick switch; and manipulating cursor control switches or track balls. The device **50** need not be an electrical device.

The pointing implement **15** can be urged into contact with a component carried by the device **50**. The component can include but is not limited to a touch-sensitive display **51**, a touch-sensitive cursor pad **53**, and a switch **55**. In **FIG. 1**, the end portion **14** of the pointing implement **15** is urged into contact with the touch-sensitive display **51**, such as the type carried by a PDA, a cell phone, or a TPC, for example. The pointing implement **15** can be used in lieu of a stylus or other pointing device that is customarily used to initiate actions or commands on the device **50**. For example, if the device **50** is a PDA that includes a stylus carried by the PDA, then the pointing implement **15** can be used in the same manner as the stylus. In instances where the finger **5** of the users hand can be used to initiate actions or commands on the device **50**, then the pointing implement **15** can be used in the same manner as the finger **5**, with the added advantage of greater precision in initiating actions due to the smaller footprint of the pointing implement **15**, particularly when the end portion **14** is used to contact the device **50**. Because the pointing implement **15** extends beyond the finger tip **4** (as will be described below) it extends the reach of the users hand. As another example, in **FIG. 1**, the pointing implement **15** can be urged into contact with a switch **55** carried by the device **50** in order to initiate an action in the device **50**. If the device **50** is a PDA or a TPC, then the button **55** can be a cursor control button that moves a cursor displayed on the display **51** up, down, left, right, etc. The switch **55** can be any

type of switch including but not limited to a button, a joy stick, a track ball, a scrolling wheel, just to name a few.

In **FIGS. 1** and **2**, the pointing implement **15** can be movable **M** in the holster **13**. Alternatively, in **FIG. 8b**, the pointing implement **15** can be movable **M** in the holder **11**. Advantages of moving **M** the pointing implement **15** (i.e. the pointing implement **15** can be moved back and forth along an axis **M**) include the ability to adjust a distance D_E the pointing implement **15** extends beyond a finger tip **4** of the finger **5** in order to effectuate the contact with the device **50**. Conversely, the pointing implement **15** can be movable **M** in the holster **13** or holder **11**, to retract the pointing implement **15** behind the finger tip **4** by a distance D_R (see **FIG. 2**). Accordingly, the movement **M** accommodates the ergonomic needs of different users by allowing for adjustability of the pointing implement **15** relative to the finger **5**. Another advantage to retracting the pointing implement **15** is that it allows the pointing implement **15** to be stowed away so that it does not get in the way of the user when the ergonomic pointing device **10** is not needed.

The pointing implement **15** can be movable **M** on the holster **13** or the holder **11** between an engaged position (see **FIG. 1**) where the pointing implement **15** is positioned to make the contact with the device **50** (i.e. because it is extended beyond the finger tip **4**) and a non-engaged position (see **FIG. 2**) where the pointing implement **15** is not positioned to make the contact with the device **50** (i.e. because it is retracted behind the finger tip **4**).

In **FIGS. 3a** through **3d**, the pointing implement **15** can be any implement including but not limited to a stylus (see **FIGS. 3b** and **3c**), a writing implement, such as a pencil or a pen (see **FIG. 3a**), and a tooth pick (see **FIG. 3d**). As another example, the pointing implement **15** can be a nail (e.g. like the type used with a hammer), a needle, or a pin (e.g. like the type used for clothing and fabrics). The stylus includes but is not limited to the type of stylus used for a PDA, a TPC, or for use on a touch-sensitive display or touch sensitive cursor pad. Although the pointing implement **15** and the

holster **13** are depicted as having a circular cross-sectional profile (see **FIGS. 5a**, **5b**, **20a**, and **20c**) the pointing implement **15** and the holster **13** are not limited to the cross-sectional profiles depicted herein. Preferably, the pointing implement **15** and the holster **13** have cross-sectional profiles that complement each other. For instance, the pointing implement **15** and the holster **13** can have a rectangular, a square, an oval, an arcuate, or a triangular cross-sectional profile.

The pointing implement **15** can be mounted on the holder **11** in a variety of ways. In **FIGS. 1**, **2**, **5a**, **5b**, **6a**, and **6b**, the pointing implement **15** is mounted to the holder **11** using a holster **13** that is connected with the holder **11**. The holster **13** is adapted to receive the pointing implement **15**. For example, if the pointing implement **15** is a stylus with a cylindrical cross-section, then the holster **13** can be a tube with a sufficient inside diameter to accommodate an outside diameter of the pointing implement **15**. The holster **13** can be permanently connected (i.e. fixedly connected) with the holder **11** (see **FIGS. 5b** and **6b**). The holster **13** can be fixedly connected with the holder **11** using a variety of methods including but not limited to fasteners such as adhesives, glue, welds, thread (i.e. sewn on), a screw, and a nut and bolt.

Alternatively, the holster **13** can be removably connected with the holder **11** (see dashed arrow **C** in **FIGS. 5a** and **6a**). Methods for removably connecting the holster **13** with the holder **11** include but are not limited to fasteners such as **VELCRO®**, a snap, a clip, a button, and a magnet. Advantages to removably connecting the holster **13** with the holder **11** include instances where either one or both of the holder **11** and/or the holster **13** is disposable and it is desirable to retain the non-disposable portion (**11** or **13**). For example, if the holder **11** is disposable, then the holster **13** is retained for attachment to a new holder **11**. Obviously, the pointing implement **15** can also be retained or the pointing implement **15** can be disposable as well.

For some uses, it may be desirable to use the ergonomic pointing device **10** in a clean room environment or in a medical environment (e.g. treating patients or for surgery). Accordingly, to prevent particulate or chemical contamination in a clean

room, the ergonomic pointing device **10** can be disposable by the user or a portion of the ergonomic pointing device **10** can be disposable (e.g. the holder **11**) and another portion can be recyclable (e.g. the holster **13** and/or the pointing implement **15**).

For uses in a medical or laboratory environment where there is a risk of cross-contamination, spread of disease, and infection, the ergonomic pointing device **10** can be sterilized prior to any use. Following the procedure, the ergonomic pointing device **10** can be destroyed or disposed of. Alternatively, only a portion of the ergonomic pointing device **10** (e.g. **11**, **13**, or **15**) is destroyed or disposed of and a remaining portion can be recycled and re-sterilized for a future use. Optionally, the ergonomic pointing device **10** can be sterilized. After the sterilization, the ergonomic pointing device **10** can be placed in a package (e.g. in a sealed container) that protects the ergonomic pointing device **10** from contamination so that the ergonomic pointing device **10** is ready for use in a future procedure. The ergonomic pointing device **10** is useful in medical procedures, such as surgery, where equipment used to monitor a patients vital signs or used to operate apparatus used for the surgery includes a touch-sensitive display interface or otherwise must by contacted by the surgeon or staff to initiate an action in the equipment.

The holder **11** can be made from a fabric or other type of flexible material. An adhesive can be applied to the holder **11** so that the holder is mounted on the finger **5** in a manner similar to an adhesive bandage, such as a band aid, for example (see **11** in **FIG. 18**). After a use in a medical procedure, a clean room environment, or some other procedure, the holder **11** can be peeled off of the finger **5** and then disposed of. Alternatively, if is desirable to recycle any portion of the ergonomic pointing device **10** (e.g. **11**, **13**, or **15**), then a material such as stainless steel, a surgical grade metal, or other suitable material can be used for the ergonomic pointing device **10** or any portion thereof.

In **FIGS. 8a** and **8b**, the pointing implement **15** can be removably mounted with the holder **11**. Similarly, in **FIGS. 1**, **2**, and **4**, if the pointing implement **15** is mounted

with the holder **11** using the holster **13**, then the pointing implement **15** can be removable from the holster **13**. The holster **13** can include a through hole terminating at two apertures **13a** and **13b** and the pointing implement **15** can be inserted into and removed from the holster **13** via the apertures (**13a, 13b**). In either case, advantages to removing the pointing implement **15** from the holder **11** or the holster **13** include replacing the pointing implement **15** if it is lost or misplaced, or changing a style or a type of the pointing implement **15** used (e.g. substituting a tooth pick for a stylus).

In **FIGS. 1**, **2**, and **4** through **8b**, the holder **11** can be in the shape of a sleeve and the holder **11** is mounted on the users finger **5** by inserting the finger **5** through the sleeve. The finger **5** can be inserted through an open end (**11a, 11b**) of the holder **11** (see **FIGS. 6a** and **6b**). In **FIGS. 7a** and **7b**, the holder **11** can be a piece of material such as a fabric (e.g. natural or synthetic) or an elastic material. A fastener **21** is connected with the holder **11** on opposite sides of opposed ends of the holder **11**. For example, **VELCRO®** can be used for the fastener **21**. In **FIG. 7c**, the holder **11** is folded over so that the fasteners **21** engage each other to form the sleeve. One of the open ends (**11a, 11b**) can be closed so that the holder **11** has the shape of a finger cot (see **FIG. 4**) and the finger **5** is inserted in the end that is not closed. The holder **11** need not have a cylindrical shape as depicted in **FIGS. 6a**, **6b**, and **7c**.

In **FIG. 8a**, the holder **11** can include a plurality of slits **11s** formed in the holder **11**. For example, a knife, scissor, or laser can be used to cut the slits **11s**. The holder **11** can be made from a fabric or an elastic material so that the slits **11s** can expand to receive the pointing implement **15** as depicted in **FIG. 8b**. The slits **11s** can also allow the pointing implement **15** to be movable **M** on the holder **11** and allow for the pointing implement **15** to be removable from the holder **11**. The embodiment of **FIGS. 7a** through **7c** can include the slits **11s** or can include the holster **13** as depicted in **FIGS. 5a** through **6b**.

The holder **11** can be mounted on at least a portion of the finger **5** on the users hand (not shown). In **FIG. 9**, the finger **5** is depicted with three sections (**1**, **2**, **3**, and **4**).

In **FIG. 10**, the holder **11** is mounted on at least a portion of section **2**. In **FIGS. 1** and **2**, the holder **11** is mounted on at least a portion of section **1**. In **FIG. 4**, the holder **11** is mounted on all of section **4** (i.e. the finger nail) and on at least a portion of section **1** (i.e. the tip of the finger **5**) such that the holder **11** has the shape of a finger cot. Although not shown, the holder **11** can also be mounted on at least a portion of section **3** of **FIG. 9**.

In **FIG. 11**, the pointing implement **15** can include at least one pin **18** (three are shown) that extends outward of a surface **15s** of the pointing implement **15**. In **FIGS. 12** and **13**, the holster **13** can include at least one slot **13s** adapted to receive the pin **18** when the pointing implement **15** is inserted into the holster **13**. Alternatively, as will be described below in reference to **FIG. 15c**, the pointing implement **15** can also include at least one o-ring **18o** connected with the pointing implement **15**. The o-ring **18o** can be seated in a groove **15g** (not shown) or it can be connected with the surface **15s**.

In **FIG. 12**, the pointing implement **15** is inserted through the aperture **13a** and then pin **18** is aligned with the slot **13s** followed by twisting the pointing implement **15** to lock the pin **18** in the slot **13s** as depicted by the dashed arrows **PT**. As a result, the pointing implement **15** is locked in the engaged position as was described above in reference to **FIG. 1**.

In **FIG. 13**, pointing implement **15** is pulled backward towards the aperture **13a** and the pin **18** (i.e. the pin **18** nearest the end portion **14**) is aligned with the slot **13s** followed by twisting the pointing implement **15** to lock the pin **18** in the slot **13s** as depicted by the dashed arrows **PT**. Consequently, the pointing implement **15** is locked in the non-engaged position as was described above in reference to **FIG. 2**.

In **FIG. 14a**, in an alternative embodiment of the ergonomic pointing device **10**, one or more rings (two are shown) are used to form the holder **11**. The rings may include an opening **12** that allows the holder **11** to be inserted over a portion of the finger **5**. On the other hand, the rings can be totally enclosed so that the holder **11** is slipped onto the finger **5** in a manner similar to a jewelry ring. A bridge **22** connects the

rings of the holder **11**. Similarly, one or more rings (two are shown) can be used to form the holster **13**. The holster **13** can be connected with the bridge **22**. The holster **13** may include an opening **24** that allows the pointing implement **15** to be inserted into the holster **13** through the opening **24**. The holster **13** may also be totally enclosed and the pointing implement **15** is inserted along an axis I into the holster **13** to mount the pointing implement **15** with the holder **11**. The holder **11** and the holster **13** can be made from a material that is flexible to allow the holder **11** to be inserted over the finger **5** through the openings **12** and to allow the pointing implement **15** to be inserted along the axis I into the holster **13** through the openings **24**.

In **FIG. 14b**, the bridge **22** connects the rings of the holder **11** and the holster **13** is a tube connected with the bridge **22**. The pointing implement **15** is inserted along an axis I into the holster **13** through one of the apertures (**13a, 13b**). Alternatively, the bridge **22** can be eliminated entirely and the tube for the holster **13** can be directly connected with the holder **11** (see arrow **11x**) such that the tube forms a bridge or spine between the rings of the holder **11**.

In **FIGS. 19a** and **19b**, the pointing implement **15** can include an aperture **15a** (two are shown) formed in the outer surface **15s** of the pointing implement **15**. In **FIG. 20a**, the rings of **FIG. 14a** that define the holster **13** can include a pin **13p** that has a profile that complements a profile of the aperture **15a**. The holster **13** can be made from a flexible material that allows the holster **13** to expand **E** to accept the pointing implement **15** through the opening **24**.

In **FIG. 20b**, the pointing implement **15** is depicted mounted in the holster **13** with the pins **13p** inserted into the apertures **15a** (see dashed lines for **15a**). Accordingly, the pointing implement **15** is movable **M** between the extended and non-extended positions as described above in reference to **FIGS. 12** and **13**. The pins **13p** and the apertures **15a** can also be used to lock the pointing implement **15** in a user preferred position in the holster **13**.

It may be desirable for the pointing implement **15** to be movable **M** in the holster **13** and yet have the pointing implement **15** retain an arbitrary position (i.e. a position selected by the user) in the holster **13** until the user decides to move the pointing implement **15** to a new position in the holster **13**. To that end, the holster **13** and/or the pointing implement **15** can include a resistance element that prevents inadvertent movement of the pointing implement **15** in the holster **13**. In **FIG. 15a**, an example of a resistance element includes a circumferential grove **13g** formed in an interior surface **25** of the holster **13**. At least one o-ring **13o** is positioned in the groove **13g**. An inside diameter of the holster **13** proximate the o-rings **13o** is less than an outside diameter of the pointing implement **15**.

In **FIG. 15b**, when the pointing implement **15** is inserted into the holster **13**, the o-rings **13o** contacts an outside surface **15s** of the pointing implement **15** and compresses the o-rings **13o** resulting in a pressure force and/or friction force **F** acting on the pointing implement **15** to prevent inadvertent movement of the pointing implement **15** in the holster **13**. Alternatively, the interior surface **25** of the holster **13** can be coated with a friction producing material such as a rubber or a silicone elastomer material that resists movement of the pointing implement **15** in the holster **13**. On the other hand, the outside surface **15s** of the pointing implement **15** can be coated with a friction producing material such as a rubber or a silicone elastomer material to accomplish the same result.

On the other hand, the resistance element can be connected with the pointing implement **15** as depicted in **FIGS. 11** and **15c**, wherein the pointing implement **15** includes at least one o-ring **18o**. The o-ring **18o** can be positioned in a groove **15g** formed in the pointing implement **15** (see **FIG. 15c**) or the o-ring **18o** can be connected with the outer surface **15s** (see **FIG. 11**). For example, the o-ring **18o** can be connected with the outer surface **15s** using an adhesive or a glue. Preferably, the groove **15g** is used to prevent the o-ring **18o** from moving or slipping off of the pointing implement **15** when it is inserted into or removed from the holster **13**.

In **FIG. 15c**, with the pointing implement **15** inserted into the holster **13**, the o-ring **18o** engages the groove **13g** to prevent inadvertent movement of the pointing implement **15** in the holster **13**. Furthermore, the resistance element can be used to position the pointing implement **15** in the engaged and non-engaged positions as described above or to lock the pointing implement **15** in a user preferred position in the holster **13**. Alternatively, the groove **13g** can be eliminated and the o-ring **18o** can be appropriately sized so that when the pointing implement **15** is inserted into the holster **13** the o-ring **18o** compresses and generates a sufficient pressure force and/or friction force **F** that acts on the pointing implement **15** to prevent inadvertent movement of the pointing implement **15** in the holster **13**.

In **FIG. 16**, the ergonomic pointing device **10** can include a holder **11** shaped like a finger splint such that the holder **11** is slipped onto the finger **5**. The pointing implement **15** can be directly mounted to the holder **11** or a holster **13** can be connected with the holder **11**. The holster **13** can be positioned on the holder **11** in various configurations including holsters (**13x, 13y**) on a top portion of the holder **11** and holster **13z** on a bottom portion of the holder **11**.

The material selected for the holder **11** can be selected so that the material is malleable or flexible so that the holder **11** can be bent and shaped to conform to a profile of the users finger **5**. As an example, a light weight material such as aluminum (**Al**) can be used for the holder **11** and for the holster **13**. The holster **13** can include the slots **13s** so that the pointing implement **15** can be locked into the engaged position (see solid lines for **15**) and the non-engaged position (see dashed lines for **15'**). Uses for the embodiment depicted in **FIG. 16** are not to be construed as being limited to a medical procedures or for medical uses only. The finger splint of **FIG. 16** is only one example of how the holder **11** can be implemented.

In **FIG. 17**, the holster **13** can be connected with the holder **11** anywhere on the holder **11** including but not limited to a side portion of the holder **11** so that when the holder **11** is mounted on the users finger **5**, the holster **13** is positioned on a side of the users finger **5**. The splint of **FIG. 16** can also be configured so that the holster **13** is positioned on a side of the finger **5** when the holder is mounted on the users finger **5** as opposed to the top or the bottom of the finger **5**. If the holster **13** is not used, then the pointing implement **15** can be mounted anywhere on the holder **11** including but not limited to a side portion of the holder **11** so that when the holder **11** is mounted on the users finger **5**, the pointing implement **15** is positioned on a side of the users finger **5**.

The holder **11** need not be mounted along an entirety of a circumference of the users finger **5** as depicted in **FIGS. 10** and **12** where the portion **2** or the portion **1** respectively are entirely wrapped by the holder **11**. Alternatively, the holder **11** can be mounted on less than the entire circumference of the users finger **5** as depicted in **FIG. 18** where the portion **1** is not entirely wrapped by the holder **11** so that some of the portion **1** is not covered by the holder **11**. An adhesive can be applied to the holder **11** of **FIG. 18** to effectuate the mounting the holder **11** on less than the entire circumference of the users finger **5**. For example, the holder **11** in **FIG. 8b** can be mounted on the finger **5** and then rotated on the finger **5** to position the pointing implement **15** on a top, bottom, or side of the finger **5**, or anywhere in between.

For the embodiments described herein, the pointing implement **15** and the holster **13** can be made from a variety of materials including but not limited to metals, plastics, glass, ceramics, composite materials, wood, and rubber. The holder **11** can be made from a variety of materials including but not limited to metals, plastics, wood, nylon, rubber, a silicone elastomer material, ceramics, a composite material, and natural or synthetic fabrics or fibers.

Although several embodiments of the present invention have been disclosed and illustrated, the invention is not limited to the specific forms or arrangements of parts so described and illustrated. The invention is only limited by the claims.